



HyperMedia for Health Promotion in the Workplace

Grant Number: R44CA59169-03

Abbreviated Abstract

This R&D project tested the application of a web-based product as a health promotion tool for the worksite. A web based communications tool for promoting worker health and safety on the job was developed. The program is a health promotion and risk management tool as well as an information management tool. Because the product design is interactive and intuitive, it has the potential to make health-related information more accessible to employees who are at risk. Research has discovered a great deal about the causes of cancer and ways to prevent it, but many who could benefit from this research either do not know about it, or are not motivated to comply with directives for prevention. This product could be an important tool in overcoming these barriers. The concept represents a systematic application of existing knowledge toward the production of a new method for presenting health promotion and cancer prevention information to the workforce.

Primary Investigator

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Barbara Rapchak is founder and CEO of Leap of Faith Technologies, an e-health company that integrates existing and emerging technologies, content, and strategies for delivery to improve patient compliance and healthcare outcomes. Leap of Faith's products have been supported by ongoing funding from NIH and 17 years of R&D. Product design is based on research in cognitive science and usability engineering, optimizing the interaction of users with information technology. Ms. Rapchak has spent twenty years as a technology and business executive leading small and mid-sized organizations through startup and growth. She is the inventor of a patented telehealth device that was selected as one of the "World's Best Technologies" in 2005, and a pediatric oncology product that received the "World Wide Web Health Award." She has been the Principal Investigator on twelve Small Business Innovation Research Grants and Contracts. Leap of Faith received the U.S. SBA Tibbetts Award for innovations in e-health, and is a solutions partner for Hewlett-Packard. The company adds strength to research and development teams, and has demonstrated its commitment as a technology partner and collaborator. They are noted for their ability to manage complex projects involving multiple disciplines and stakeholders, creating strong, multidisciplinary work teams. Previous and current collaborators include Ronald McDonald Children's Hospital, Children's Memorial Hospital, University of Wisconsin Medical School, University of Chicago Medical School, the National Safety Council, NASA Kennedy Space Center, Zebra Technologies, Motorola, and Hewlett-Packard.

Visit the SBIR Product Directory online at <http://cancercontrol.cancer.gov/hcirb/sbir>



Research Team & Affiliations

Staff: Leap of Faith Technologies, Inc., Barbara Rapchak, PI

Total Budget

\$777,316.00

Research Objectives

Aim 1: Develop a Web-based safety and training application. We successfully developed a robust, interactive program with a large chemical database and novel personalization features. The program combines a chemical's inherent hazard, the user's self-reported exposure level, and optional health data supplied by the user to present a personalized statement of risk. The program, called @ware, is available by subscription on the World-Wide Web at <http://www.awareworks.com>.

Aim 2: Test the application at six industrial test sites. We installed access to the @ware program at six test sites in Illinois and Ohio: two large truck manufacturing plants, a circuit board and electronics manufacturer, an environmental consulting firm, a plastic container manufacturer, and a regional healthcare provider. Each site used the program for approximately one year.

Aim 3: Complete a psychosocial study using employee responses to baseline and post-test surveys at test and control sites. We conducted baseline surveys at six test sites and two control sites, asking questions on demographics, measure of risk/predisposing factors, measures of exposure, measures of protection, stage of change, knowledge, attitude, prompts and social pressure to take precautions, and behavioral intentions/self-efficacy. Post-test surveys were distributed approximately one year later, measuring the same factors and asking users at the test sites to evaluate the @ware program.

Theory/Hypothesis

We theorized that subjective norms and perceived behavioral control would be predictors of protective behavior and would increase among the respondents in the test group relative to the control group.

Experimental Design

We successfully developed a robust, interactive program with a large chemical database and novel personalization features. The program combines a chemical's inherent hazard, the user's self-reported exposure level, and optional health data supplied by the user to present a personalized statement of risk. The program, called @ware, is available by subscription on the World-Wide Web at <http://www.awareatwork.com>.

Final Sample Size & Study Demographics

We installed access to the @ware program at six test sites in Illinois and Ohio: two large truck manufacturing plants, a circuit board and electronics manufacturer, an environmental consulting firm, a plastic container manufacturer, and a regional healthcare provider. Each site used the program for approximately one year.



Data Collection Methods

We conducted baseline surveys at six test sites and two control sites, asking questions on demographics, measure of risk/predisposing factors, measures of exposure, measures of protection, stage of change, knowledge, attitude, prompts and social pressure to take precautions, and behavioral intentions/self-efficacy. Post-test surveys were distributed approximately one year later, measuring the same factors and asking users at the test sites to evaluate the @ware program.

Outcome Measures

See research results

Evaluation Methods

A regression analysis model of survey responses, which used attitudes, norms, and perceived behavioral control at baseline to predict intentions to use safety procedures at post-test, produced significant results ($F(4,88) = 3.176, p < .05$).

A regression analysis model of survey responses, which used intentions, attitudes, norms, and perceived behavioral control at baseline to predict behavior at post-test, produced significant results ($F(5,81) = 4.055, p < .01$).

Research Results

- Survey responses indicated that a large majority of employees work with hazardous materials (76% at baseline, 80% at post-test).
- Survey responses indicate that most employees never use Material Safety Data Sheets (71%) or other sources of information on hazardous materials (79%). The most common reason for not using this information was that they were not required to.
- Survey respondents indicated that their primary sources of safety information were formal training and their supervisors.
- For both the control and test groups, we found that employees' attitudes, norms, and perceived behavioral control, as reported on baseline and post-test surveys, predicted intentions to use safety procedures and equipment. This finding is consistent with the Theory of Planned Behavior upon which we modeled this intervention.
- Survey respondents rated the program as easy to use (mean rating 3.61 on a 1 to 5 scale), helpful (3.63), and easy to understand (3.62).
- Survey respondents said they would recommend the program to others (3.74).
- Test sites that provided the best cooperation and had the highest level of use of the program rated the program more highly on post-test surveys.
- Subjective norms and perceived behavioral control increased significantly among the respondents in the test group relative to the control group.
- Results from regression analyses suggest that subjective norms and perceived behavioral control may be important constructs to address in any intervention intended to increase safe behavior. Regardless of whether respondents thought using safety equipment and procedures was "useful" or "attractive", their perceptions that others who are important to them want them to use safety equipment and procedures and their perceptions of the degree to which they are able to consistently use safety equipment and procedures are important determinants of intentions to engage in safe behavior.



Barriers & Solutions

Product(s) Developed from This Research

www.awareatwork.com